

### REMARKS

Claims 8-20 are pending in the present application. Applicant has amended claims 11 and 20 to make grammatical corrections. No new matter has been added to the amended claims. Reconsideration of the claims is respectfully requested.

### CLAIM REJECTIONS

#### 35 U.S.C. 112 rejection

The Examiner has rejected claim 18 under 35 U.S.C. 112, first paragraph, for failure to comply with the written description requirement. The Examiner asserts that the application fails to adequately describe a method of cracking the impregnated carbonaceous material by a heating process. Applicant notes that the specification refers to a cracking process in paragraph [0020]. The pressurization described as expediting cracking in paragraph [0020] is a modification of the heating process described in paragraph [0019], and the specification thus supports the teaching of cracking by a heating process. Heating without highly pressurizing the vessel produces cracking, though not the “advantageous” result of the technique of paragraph [0020]. If heating and pressurization are both used in a cracking process, they are used simultaneously. By way of comparison, the pressurization and heating steps of impregnation may be sequential, and are so described in paragraph [0018]. This distinction between impregnation and cracking can also be appreciated by realizing that the former is a physical process, whereas the latter is a chemical process. For these reasons, the rejection of claim 18 under 35 U.S.C. 112, first paragraph, is believed to have been overcome.

#### 35 U.S.C. 102 rejection over Cope

The Examiner has rejected claims 8, 10-12, 14-15 and 17-18 under 35 U.S.C. 102(b) for anticipation by U.S. Patent No. 3,429,486 to Cope et al. (“Cope”). The Examiner cites Cope as teaching an article consisting of silica that is at least 85% amorphous, contains up to 3% other oxides including CaO, FeO, MgO, Na<sub>2</sub>O and K<sub>2</sub>O, contains 4% water and is impregnated with tar. The Examiner also cites Cope as teaching a method of producing an article comprising vitreous silica impregnated with a carbonaceous material, in which a heating process facilitates the impregnation of the material, and a cracking process that also occurs by heating follows the impregnation.

Applicant notes that the object of the present invention is a refractory article for guiding or conveying a solidified material such as glass sheets or metal wires. The refractory article is for instance a roller or a guiding segment and consists of a vitreous silica basis impregnated with a carbonaceous material.

After some time in service, a significant accumulation or pick-up of mixed tin and iron oxides is observed on the refractory articles of the prior art resulting in a serious marking of the solidified material, as is noted in paragraphs [0007] and [0008] of the present application. Some improvement in terms of pick-up has been obtained with an article made of graphite or coated with graphite, however, such articles are too weak in terms of erosion resistance and their service life is limited.

The object of the present invention is thus a refractory article that exhibits excellent mechanical resistance, reduced pick-up, reduced marking of the solidified material and longer service life as is noted in paragraph [0012]. These properties are obtained by impregnation of a vitreous silica based refractory article with a carbonaceous material. The article according to the invention combines the anti-pick-up properties of the carbonaceous material with the good mechanical and erosion resistance of the vitreous silica. This way, the service life of the refractory article is increased and the quality of the solidified material is significantly improved.

Cope relates to a stopper head made of vitreous silica and impregnated with tar. The stopper head co-operates with a nozzle for regulating the flow of molten metal during its transfer from a metallurgical vessel into another. Cope does not teach a refractory article for guiding or conveying a solidified material. Indeed, the refractory article of Cope is not capable, as disclosed, of guiding or conveying a solidified material. A structural difference (e.g., the provision of an external guideway) would have to be provided to the Cope article to enable it to guide or convey a material according to the present invention. For these reasons, the rejection of claims 8, 10-12, 14-15 and 17-18 under 35 U.S.C. 102 (b) is believed to have been overcome.

#### 35 U.S.C. 103(a) rejection over Cope

The Examiner has rejected claims 9, 13, 16 and 19-20 under 35 U.S.C. 103(a) for obviousness over Cope. The Examiner asserts that, although Cope does not teach a refractory article with a composition of 1-6 wt. % carbonaceous material and more than 90 wt. % amorphous silica, or the use of pressure in the impregnation and cracking steps, one skilled in the

art would arrive at the present invention through the process of routine optimization of the article.

Applicant notes that the present invention relates to a refractory article for guiding or conveying a solidified material such as glass sheets or metal wires. The problem addressed in the present invention is the tin pick-up observed on the surface of the articles and the resulting marking (damage) of the solidified material. This problem is observed in particular applications only, involving a molten tin bath or a galvanization bath.

The skilled person who wants to provide an improved refractory article for guiding or conveying a solidified material (which exhibits excellent mechanical resistance, reduced pick-up, reduced marking of the solidified material and longer service life) has first of all no reason to consult Cope which relates to refractory articles for molten metal applications and where tin pick-up does not exist. Even if it is assumed that the skilled person would do so, there is no hint in Cope that the material of the stopper head (vitreous silica impregnated with a carbonaceous material) could be used to manufacture articles for conveying or guiding solidified material, let alone a teaching that such material could reduce tin pick-up.

For these reasons, the rejection of claims 9, 13, 16 and 19-20 under 35 U.S.C. 103 (a) is believed to have been overcome.

Applicant respectfully submits that claims 8-20 are patentable over the prior art. Early and favorable action is earnestly solicited.

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